

CLAIMS

What is claimed is:

1. A transport system transporting an article along a transport route, comprising:
 - transporting vehicles moving along the transport route in opposite directions of the transport route;
 - a job assigning part receiving at least one job order, calculating a transport time to be taken when the transport vehicles in the transport route perform respective job orders, and creating job assignment information to assign each job order to a corresponding one of the transport vehicles having a minimum transport time according to each job order; and
 - a route searching part receiving the job assignment information from the job assigning part, creating route search information by searching an optimum route having the minimum transport time to be taken when the transport vehicle assigned with the job order travels from a starting position to a target position in the opposite directions of the transport route, and updating the route search information by searching routes in real time when the transport vehicle travels.
2. The transport system according to claim 1, wherein the transport route comprises a predetermined reservation position disposed between the starting position and the target position as a reserved section, and the transport vehicle travels from the starting position to the predetermined reservation position.
3. The transport system according to claim 2, wherein the transport time of the transport vehicle comprises:
 - a traveling time from the starting position to the target position;
 - a working time of the transport vehicle;
 - a section reservation time of other ones of the transport vehicles; and
 - an occupation time of the other transport vehicles.
4. The transport system according to claim 3, wherein the transport route comprises nodes, and the traveling time comprises:
 - a sum of time calculated from distances between the nodes from the starting position to the target position and speeds of the transport vehicle traveling between the nodes.

5. The transport system according to claim 3, wherein the transport route comprises nodes, and the working time of the transport vehicle comprises:

a first time to be taken when the transport vehicle is in place to load and/or unload the article at the nodes corresponding to the starting position and the target position;

a second time to be taken when the transport vehicle is charged;

a third time to be taken when an error, which occurs in the transport vehicle, is solved; and

a fourth time to be taken when the job order currently performed is completed.

6. The transport system according to claim 4, wherein the working time of the transport vehicle comprises:

a first time to be taken when the transport vehicle is in place to load and/or unload the article at the nodes corresponding to the starting position and the target position;

a second time to be taken when the transport vehicle is charged;

a third time to be taken when an error, which occurs in the transport vehicle, is solved; and

a fourth time to be taken when the job order currently performed is completed.

7. A transport system transporting an article from a start node to a target node along a transport route having nodes including the start and target nodes, comprising:

transporting vehicles moving along the transport route in opposite directions of the transport route;

a job order manager unit receiving at least one job order from an external host to move the article disposed in the start node to the target node, creating job assignment information to assign the at least one job order to a corresponding one of the transport vehicles having a minimum transport time to be taken when the one transport vehicle performs the at least one job order, and creating route search information by searching an optimum route having the minimum transport time to be taken when the one transport vehicle travels from the starting node to the target nodes in the opposite directions of the transport route; and

a job order executing unit controlling the one transport vehicle according to the job assignment information and the route search information.

8. The transport system according to claim 7, wherein the nodes comprise first nodes and second nodes, the transport route comprises first and second sub-routes on which the first and second nodes are disposed, respectively, and third sub-routes coupling corresponding ones of the first nodes of the first sub-route and the second nodes of the second sub-route, and the optimum route represents that the one transport vehicle disposed on one of the nodes moves from the one of the nodes to the start node using a nearest one of the third sub-routes.

9. The transport system according to claim 8, wherein the optimum route represents that the one transport vehicle moves from the start node to the target node using another nearest one of the third sub-routes disposed between the start node and the target node.

10. The transport system according to claim 8, wherein the nodes comprise a reserved section node disposed between the start node and the target node for one of the transport vehicles having a priority, and the one transport vehicle disposed on one of the nodes moves from the one of the nodes to the start node by using the reserved section node.

11. The transport system according to claim 10, wherein the minimum transport time comprises:

a time taken when the one transport vehicle is disposed in the reserved section node.

12. The transport system according to claim 10, wherein the minimum transport time comprises:

a time taken when the other one of the transport vehicles is disposed in the reserved section node when the other one of the transport vehicles has the priority.

13. The transport system according to claim 8, wherein the minimum transport time comprises:

a time taken when the other one of the transport vehicles occupies the nodes on the optimum route between the start and target nodes.

14. The transport system according to claim 8, wherein the one transport vehicle moves the first, second, and third sub-routes of the transport route in the opposite direction.

15. The transport system according to claim 14, wherein one of the third sub-routes is coupled to a third node of the first nodes and a fourth node of the second nodes, the start and target nodes are disposed on the first and second sub-routes, respectively, the third and fourth nodes are disposed between the start and target nodes, and the one transport vehicle moves along the one of the third sub-routes during moving from the start node to the target node when the one of the third sub-routes is a shortest route between the start and target routes among the first, second, third sub-routes.

16. The transport system according to claim 15, wherein the one transport vehicle does not move along another one of the third sub-routes other than the one of the third sub-routes.

17. The transport system according to claim 7, further comprising:
a job assigning part calculating the transport time to be taken when the transport vehicles in the transport route perform the at least one job order, and creating job assignment information to assign each job order to a corresponding one of the transport vehicles having a minimum transport time according to the at least one job order.

18. The transport system according to claim 17, further comprising:
a route searching part receiving the job assignment information from the job assigning part, creating the route search information by searching the optimum route having the minimum transport time to be taken when the one transport vehicle assigned with the job order travels from the starting node to the target node in the opposite directions of the transport route.

19. The transport system according to claim 18, wherein the route searching part updates the route search information by searching routes in real time when the other one of the transport vehicles travels between the start node and the target node according to another job order.

20. The transport system according to claim 7, wherein the transport vehicles moves between adjacent nodes in the opposite directions.

21. A transport method of transporting an article from a start node to a target node along a transport route having nodes including the start and target nodes, comprising:

moving transport vehicles along the transport route in one of opposite directions of the transport route;

receiving at least one job order from an external host to move the article disposed in the start node to the target node;

creating job assignment information to assign the at least one job order to a corresponding one of the transport vehicles having a minimum transport time to be taken when the one transport vehicle perform the at least one job order;

creating route search information by searching an optimum route having the minimum transport time to be taken when the one transport vehicle travels from the starting node to the target nodes in the opposite directions of the transport route; and

controlling the one transport vehicle according to the job assignment information and the route search information.